

WE CLAIM:

1           1. A method for identifying a compound capable of interfering with  
2 binding of a SAK polypeptide or fragment thereof, the method comprising the steps of:

3                 (i) combining a SAK polypeptide or fragment thereof with a Chk2  
4 polypeptide and the compound, wherein the SAK polypeptide or fragment thereof has  
5 kinase activity and is encoded by a nucleic acid that hybridizes under stringent conditions  
6 to a nucleic acid encoding a polypeptide having an amino acid sequence of SEQ ID  
7 NO:2; and

8                 (ii) determining the binding of the SAK polypeptide or fragment thereof to  
9 Chk2.

1           2. The method of claim 1, wherein the SAK polypeptide or fragment  
2 thereof and the Chk2 polypeptide are combined first.

1           3. The method of claim 1, wherein the binding of the SAK  
2 polypeptide or fragment thereof to Chk2 is determined *in vitro*.

1           4. The method of claim 1, wherein the SAK polypeptide or fragment  
2 thereof and the Chk2 polypeptide are expressed in a cell.

1           5. The method of claim 4, wherein the cell is a yeast or a mammalian  
2 cell.

1           6. The method of claim 5, wherein the SAK polypeptide or fragment  
2 thereof is fused to a heterologous polypeptide.

1           7. The method of claim 1, wherein the binding of the SAK  
2 polypeptide or fragment thereof to Chk2 is determined by measuring reporter gene  
3 expression.

1           8. The method of claim 1, wherein the binding of the SAK  
2 polypeptide or fragment thereof to Chk2 is determined by measuring SAK kinase activity.

1           9. A method for identifying a compound that modulates cellular  
2 proliferation, the method comprising the steps of:

1                           10. The method of claim 9, wherein the functional effect is measured  
2     *in vitro*.

1 11. The method of claim 10, wherein the functional effect is a physical  
2 effect.

1                   12. The method of claim 11, wherein the physical effect is determined  
2 by measuring ligand or substrate binding to the polypeptide.

1                           13. The method of claim 10, wherein the functional effect is a chemical  
2                           effect.

1                   14. The method of claim 13, wherein the chemical effect is determined  
2 by measuring kinase activity of the SAK polypeptide.

1                   15. The method of claim 9, wherein the polypeptide is expressed in a  
2 eukaryotic host cell.

1                           16. The method of claim 15, wherein the functional effect is a physical  
2                           effect.

1                   17. The method of claim 16, wherein the physical effect is determined  
2 by measuring ligand or substrate binding to the polypeptide.

1                   18. The method of claim 15, wherein the functional effect is a chemical  
2 or phenotypic effect.

1                   19. The method of claim 18, wherein the chemical or phenotypic effect  
2 is determined by measuring kinase activity of the SAK polypeptide.

1                   20. The method of claim 18, wherein the chemical or phenotypic effect  
2 is determined by measuring cellular proliferation.

1                   21.     The method of claim 20, wherein the cellular proliferation is  
2 measured by assaying for DNA synthesis or fluorescent marker dilution.

1                   22 .    The method of claim 21, wherein DNA synthesis is measured by  
2 <sup>3</sup>H thymidine incorporation, BrdU incorporation, or Hoescht staining.

1                   23.     The method of claim 21, wherein the fluorescent marker is selected  
2 from the group consisting of a cell tracker dye or green fluorescent protein.

1                   24.     The method of claim 9, wherein modulation is inhibition of cellular  
2 proliferation.

1                   25.     The method of claim 9, wherein modulation is inhibition of cancer  
2 cell proliferation.

1                   26.     The method of claim 15, wherein the host cell is a cancer cell.

1                   27.     The method of claim 26, wherein the cancer cell is a breast,  
2 prostate, colon, or lung cancer cell.

1                   28.     The method of claim 26, wherein the cancer cell is a transformed  
2 cell line.

1                   29.     The method of claim 28, wherein the transformed cell line is PC3,  
2 H1299, MDA-MB-231, MCF7, A549, or HeLa.

1                   30.     The method of claim 26, wherein the cancer cell is p53 null or  
2 mutant.

1                   31.     The method of claim 26, wherein the cancer cell is p53 wild-type.

1                   32.     The method of claim 9, wherein the polypeptide is recombinant.

1                   33.     The method of claim 9, wherein the polypeptide is encoded by a  
2 nucleic acid comprising a sequence of SEQ ID NO:1.

1                   34 .    The method of claim 9, wherein the compound is an antibody.

1           35 .   The method of claim 9, wherein the compound is an antisense  
2 molecule.

1           36 .   The method of claim 9, wherein the compound is a small organic  
2 molecule.

1           37 .   The method of claim 9, wherein the compound is a peptide.

1           38.   The method of claim 37, wherein the peptide is circular.

1           39.   A method for identifying a compound that modulates cellular  
2 proliferation or chemosensitivity, the method comprising the steps of:

3                 (i) contacting the compound with an SAK polypeptide or a fragment  
4 thereof, the SAK polypeptide or fragment thereof encoded by a nucleic acid that  
5 hybridizes under stringent conditions to a nucleic acid encoded by a polypeptide  
6 comprising an amino acid sequence of SEQ ID NO:2;

7                 (ii) determining the physical effect of the compound upon the SAK  
8 polypeptide; and

9                 (iii) determining the chemical or phenotypic effect of the compound upon  
10 a cell comprising an SAK polypeptide or fragment thereof, thereby identifying a  
11 compound that modulates cellular proliferation or chemosensitivity.

1           40.   A method of modulating cellular proliferation in a subject, the  
2 method comprising the step of administering to the subject a therapeutically effective  
3 amount of a compound identified using the method of claim 9.

1           41.   The method of claim 40, wherein the subject is a human.

1           42.   The method of claim 41, wherein the subject has cancer.

1           43.   The method of claim 40, wherein the compound is an antibody.

1           44.   The method of claim 40, wherein the compound is an antisense  
2 molecule.

1           45.   The method of claim 40, wherein the compound is a small organic  
2 molecule.

- 1                  46.     The method of claim 40, wherein the compound is a peptide.  
1                  47.     The method of claim 46, wherein the peptide is circular.  
1                  48.     The method of claim 40, wherein the compound inhibits cancer cell  
2 proliferation.

1                  49.     A method of modulating cellular proliferation in a subject, the  
2 method comprising the step of administering to the subject a therapeutically effective  
3 amount of a SAK polypeptide, the polypeptide encoded by a nucleic acid that hybridizes  
4 under stringent conditions to a nucleic acid encoding a polypeptide having an amino acid  
5 sequence of SEQ ID NO:2.

1                  50.     A method of modulating cellular proliferation in a subject, the  
2 method comprising the step of administering to the subject a therapeutically effective  
3 amount of a nucleic acid encoding a SAK polypeptide, wherein the nucleic acid  
4 hybridizes under stringent conditions to a nucleic acid encoding a polypeptide having an  
5 amino acid sequence of SEQ ID NO:2.